pace with the progress of the disease. A decrease in the number of cells in the spinal fluid is considered prognostically favorable. The fact that the fluid in the canal can be cut off from that in the cranium and form a poor index of the true condition of the latter is shown by the figures in this case. The initial count showed 2600 cells to the c. m. m. and these were of the polymorphonuclear type. Counts taken on successive days demonstrated a diminution in the number of these cells. The count on the day of death being 860 cells to the c. m. m.

The same condition was present in another case recently observed in the clinic. A cell count taken at the time of the mastoid operation being in this instance 1040 the c. m. m. The counts taken on successive days showing 536, 97, 216, 251, and the patient dying the following day.

Closure of the foramen of Mazendie is given as the probable reason for the lack of participation of the spinal canal to the extent of the cranial meninges. This is borne out by the failure of the Kernig and other spinal signs which presented in both of these cases.

AN INTERESTING OPERATIVE EAR CASE.*

By CULLEN F. WELTY, M. D., San Francisco.

Dr. H. C. Moffitt's Medical Report: The history was negative, except for measles and mumps in childhood. Headaches, a year ago when he commenced wearing glasses. Quite frequent nose bleeds during the summer months in Reno. Very infrequent colds. He seemed a perfectly well man in every way until December he began to have cold, headaches, slight cough and aching of the limbs. He quit work from December 10th until December 23rd. At end of this time, feeling better; but cough continued and he gradually got worse, until the middle of January, the paroxysms were so severe as to make him vomit. On the 20th of January, following a severe coughing spell he vomited, his cough stopped and did not recur. He started to hiccough. This first attack lasted for four days, with occasional short intermissions. Following this time, hiccough and dizziness troubled him until he came here March 9th. On February 22nd, for some reason not apparent, he had a paracentesis of the right ear drum. This was repeated February 29th. There has been a slight discharge from the right ear ever since. Just before he came, on first arising, he felt nauseated and vomited. When I first saw him, he had a slight nystagmus on looking to the right, otherwise, the cranial nerves were perfectly normal. The veins of the eyelids were a little prominent. Arteries a little stiff. A little emphysema of the lungs. Few dry rales on the left lobe, right side. Hiccough involving both sides of the diaphragm. Spleen enlarged a little by percussion. Rather faint abdominal reflex on the left, otherwise normal.

The first days, when seen at St. Luke's, he did reasonably well. Hiccough was controlled by medication. He had dizziness when he would sit up or turn to the right. Nystagmus to the left and right; always moderate in degree. He became morose and restless. At times, just after hiccough attacks would cease, he had a temporary confusion, with inability to speak or understand. At this time, fundus which had been normal on entrance, showed gradual swelling of the disc and edema of the retina, right more marked than left. Slight incoordination of the left hand. No abnormalities in reflexes. Occasionally slight headache. By March 12th, there had been a good deal of increase of headache, with inability and stupor. At this time, choked disc, occasional vomiting; lumbar puncture showed fluid under pressure and this relieved the headache.

All this time various diagnosis had been considered. Apparently, labyrinthian reactions to caloric tests were normal. Slight discharge from the ear contained no definite type or organism. The serous labyrinthitis could not explain all his symptoms, particularly the hiccoughs and peculiar, slight epileptiform seizures following. At this time, would have apparently some pharyngeal contractions and slight irregularity of breathing. Dizziness and nystagmus suggested a cerebellar lesion and various tumors of the cerebral pontain angle were considered. The history suggested the possibility of bronchitis, with secondary brain abscess, but careful examination of the lungs did not show at any time any changes up to this date. It seemed more probable that he had some cerebellar tumor with pressure on the pons accounting for the hiccough and the peculiar epileptiform attacks with pharyngeal and respiratory symptoms. The exaggeration of the symptoms early in March, explained on the basis of a hydrocephalus. Despite the apparent negative ear findings, there was discharge in the right ear and it was thought advisable to explore the mastoid on account of his temperature which had been present right along, though slight in degree, not going beyond 100°. He apparently was better for a few days following operation. A few days after operation, he again developed the same hiccough, dizziness, mental confusion, without more localizing symptoms or signs; it seemed more probable that we were dealing with brain tumor rather than with infection, and yet after explaining matters to the family, it seemed justifiable to investigate the sinus and adjacent dura. Apparently the sinus wall at operation was not entirely normal, but there was no thrombosis.

Right after operation, he became worse, had a steady rise in temperature, pulse and respiration. He developed signs in the right upper lobe; apparently no consolidation, but very diffuse bronchitis with numerous, peculiar, bubbling rales. With this, there was a profuse expectoration partly edema, partly purulent. This was unfortunately not examined.

Ear history:

Following a coughing spell, had pain in the right ear which increased somewhat. This was accompanied by vertigo. On the 22nd of February, had incision of the drum membrane. Follow-

* Read before the Forty-sixth Annual Meeting of the Medical Society of California.

ing this incision of the drum membrane, the symptoms did not wholly abate and had another paracentesis seven days later. Indefinite pain back of the ear and some temperature.

Examination by myself: Right ear, some discharge from this ear. No pain over the tip or on this side of the head. Bulging of the posterior, inferior wall, (which happens very seldom.) Nystagmus to the opposite side and to the same side. Some tinnitus. Hearing good. Tuning fork: Weber to the bad ear; Rinne negative in the bad ear. Seven foot hearing tube positive. Both ears reacted in the normal way to cold water. Facial intact.

My diagnosis: Acute mastoiditis requiring immediate operation.

My reasons for same were as follows:

1st—Nystagmus in the midst of a discharging ear.

2nd—Bulging of the posterior, inferior quadrant, which indicated pus retention.

3rd—Persistent temperature with a discharging ear.

The symptoms that I could not explain and thought were accidental were hiccough; at times, there was a something that simulated an epileptiform seizure. Thought this in some way due to a reflex, or possibly to a brain abscess.

Operative findings rather large, pneumatic mastoid. All cells contained pus, some under pressure. A deep cell well into the petrous portion of the temporal bone and below the bony meatus. (This cell produced the bulging from below, upwards.) The dura of the middle fossa uncovered and healthy. The sinus accidentally uncovered.

The following two days, the patient was much improved. Less vertigo, no pain, less temperature. On the third day was not so well. An increase of temperature; vertigo. Dressings changed. Fourth day, more temperature; vertigo increased. A spell of hiccough and a seizure, simulating epilepsy. At this time, I thought that probably I had injured the sinus at operation and that a nural clot was keeping up the temperature, or that in doing a dressing the patient had become infected. During the time that this was going on, he would have frequent spells of hiccough and an occasional seizure.

There were no signs of meningitis or brain abscess, with the exception of the seizures and the hiccough. Nevertheless, you will note from the temperature chart that two days prior to this, the temperature fell on two successive days to normal or below and again rose to almost 103°. So in the hope of finding something, this second operation was done.

We concluded to explore the sinus for possible infection. This was done on the 24th day of March, twelve days following the first mastoid operation.

Findings: perfectly healthy in every particular. Following this procedure, the temperature increased. All the symptoms increased, with new ones which indicated a very grave prognosis. He grew rapidly worse and died in a few days.

Now the question naturally follows—what was the cause of the man's death?

The bacteriological findings of the pus from the ear by repeated examinations, showed a mixed infection with nothing suggestive.

Blood examinations repeatedly—everything negative.

Lumbar puncture—negative findings The pressure was not materially increased.

Brain abscess a possibility, with a decided leaning to a cerebellar tumor at this time.

At autopsy were found most remarkable scattered, grayish nodules at the cortex about one-half c. m. in diameter. These looked at first like multiple tumors, but were found to be tubercles. There was a secondary involvement wholly of the right lung by miliary tubercles. There was no obvious old focus in the lung. It was difficult even at autopsy to explain the predominant symptoms. They have to be referred to involvement of the cerebellar and pons. Cortical tuberculosis gave no signs. The spread of miliary tuberculosis of the right lung was a terminal event. The ear signs were never prominent and would at no time explain all the dizziness, hiccough, or peculiar respiratory symptoms. The operations on the mastoid and sinus were done chiefly because of the temperature, which could not well be explained by what was found on clinical examination. Internal ear intact; sinus healthy.

While this particular case was hopeless from the very beginning, it illustrates beautifully how careful one must be in the analysis of the entire case as a whole.

During the entire case, Dr. Moffitt would say at various times that he believed there was a new growth in the small brain. I contended on the other side that had he a tumor of the small brain, he should have errors in his pointing, and the nystagmus would be more pronounced and definite. Furthermore, the caloric reactions were always as they should be, and if had a tumor, it must be a brain abscess in the presence of the suppurating ear. However, he had no ear symptoms to indicate the same.

As was shown at autopsy, there were large numbers of miliary tubercles all through the cerebellum and through the entire brain, lungs, the liver, the kidneys, everywhere. In fact, this individual (apparently in perfect health), was riddled with the miliary tubercles.

The brain symptoms that he had, we easily explained. The wonder was that he did not have more and that he lived so long.

COLLOIDAL MASTIC REACTION OF CEREBROSPINAL FLUID.

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Emmanuel[1] has suggested a new spinal fluid reaction in the study of nervous syphilis. Influenced by the high susceptibilities of colloidal gold to the action of certain fluid proteins and extraneous colloids, and the difficulties encumbering the

1. Emmanuel—Berliner Wochenschrift. Vol. 52, no. 30, p. 792.